

## Programming 2

### Tutorial and Practical 8

*This tutorial will build on last week's session, by adding more advanced GUI components and layouts to the shape drawing application.*

#### Tutorial Session

The current application draws figures in a colour and size determined by the programmer. Add some functionality to the user interface that allows the user to select these parameters interactively (i.e. using direct manipulation techniques).

There are a number of new items that need to be added to the user interface. At a minimum, the following attributes of each shape should be configurable by the user:

- Colour
- Length
- Width

1. Following are a list of UI components that could be useful.

- Text fields
- Radio buttons
- Check boxes
- Combo Boxes
- Sliders

- Explain the operation and general purpose of each of the components.
- Describe if and how each could be used to implement the functionality described above.

*Note that the ultimate goal is to create an intuitive user interface which achieves speed and accuracy whilst minimising the chance of data entry error:*

2. Given these additional components, attention will have to be given to the layout of the window. How can the components be laid out in an intuitive manner, keeping in mind:

- That each set of components is arranged in a logical grouping.
- That each component is given sufficient room to perform its function.
- That the component(s) most in need of extra screen area (e.g. the shape drawing component) is the one that grows when the window is resized?

*Note that it is common to have multiple nested containers, each with their own layout management, in order to achieve the final application layout.*

3. How will these new components affect the way in which the program runs? Are there any changes that need to be made to the event handling (and if so, how will it change)?

## Practical Session

Add the new interface features and functionality to your shape drawer from last week, using the design, approaches and techniques covered in the tutorial.

To this application, add a menu bar. Give the application a menu with an “exit” item.

*(You will need to refer to the lecture notes and/or the Java API reference to complete this task)*

- a. Ensure that both exit options (*Exit* menu item, and closing the window's close box) perform the same task. They should both show the user a confirmation dialog before finally closing the application.
- b. Add a keyboard shortcut and mnemonic to the exit menu item.